

Payload Separation Performance of a New 6U CubeSat Canisterized Satellite Dispenser

Problem Statement

- Measurement of the separation velocity are contaminated by gravity effects and partial binding on deployment.
- Tip-off rates are unknown – rollers used to support the payload in ground tests prevent rotation.
- High tip off rates in smaller but similar P-POD canisters are known and can sometimes prevent determination of spacecraft attitude.

Technology Development Team

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Proposed Flight Experiment

Experiment Readiness:

- June 2014.

Test Vehicles:

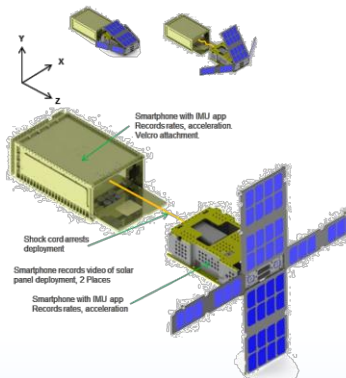
- Zero Gravity Corporation Boeing 727-200

Test Environment:

- The experiment has not flown in any previous micro-gravity flights. The flight environment requested is micro-gravity to characterize separation velocities and rotation rates.

Test Apparatus Description:

- The experiment consists of the CSD mounted to a frame for ease of handling and increased inertia. The CSD is loaded with an instrumented mass simulator. When commanded, the mass simulator will deploy from the canister until it clears the door. At that point, a restraining cable will prevent further forward movement.



Technology Maturation

- Microgravity and on-orbit performance characterization needed to mature to TRL 8
- Steps to Mature:
 - Characterize the separation dynamics in microgravity, Sep 2012
 - Fly aboard ORS-4, 2014
 - Characterize the on-orbit performance, 4
- Maturing towards TRL 9

Objective of Proposed Experiment

- Characterize the separation dynamics of the 3U and 6U Canisterized Satellite Dispenser with specific emphasis on separation velocities and rotation (tip-off) rates.
- The experiment will deploy multiple mass simulators with varying mass from dispensers with both nominal and high spring rates.